

FORM PCT 1390
REV. 5/93

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NO.

BLAIMSCHEIN-29 PCT

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)

10/070965

INTERNATIONAL APPLICATION NO.
PCT/AT00/00225INTERNATIONAL FILING DATE
23 AUGUST 2000PRIORITY DATE CLAIMED
16 SEPTEMBER 1999

TITLE OF INVENTION

TOOTHED-BELT OR CHAIN WHEEL

APPLICANT(S) FOR DO/EO/US

FRANZ BLAIMSCHEIN

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371 (f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau)
 - b. ☐ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has **NOT** expired.
 - d. ☐ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information:

PCT/ISA/210 - Int'l. Search Report (English)

1 SHEET OF FORMAL DRAWINGS

Applicant Claims Priority under 35 U.S.C. §119 of AUSTRIAN Application No. GM 635/99, filed: 16 SEPTEMBER 1999.
 Applicant Claims Priority under 35 U.S.C. §120 of: PCT No. PCT/AT00/00225, filed: 23 AUGUST 2000.

APPLICATION NO. (if known use 37 CFR 1.52) 107070965				INTERNATIONAL APPLICATION NO. PCT/AT00/00225	ATTORNEY'S DOCKET NO. BLAIMSCHEIN29PCT
<input checked="" type="checkbox"/> The following fees are submitted: Basic National Fee (37 CFR 1.492(a)(1)-(5)): Search Report has been prepared by the EPO or JPO.....\$890.00 International preliminary examination fee paid to USPTO (37 CFR 1.482)\$710.00 Neither international preliminary examination fee paid (37 CFR 1.82) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO.....\$1,040.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4).....\$100 ENTER APPROPRIATE BASIC FEE AMOUNT =				CALCULATIONS	PTO USE ONLY
				\$ 890.00	
Surcharge of \$130.00 for furnishing the oath or declaration later than ___ 20 ___ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).					
Claims	Number Filed	Number Extra	Rate		
Total Claims	3 - 20 =	- 0 -	X \$18.00	\$	
Independent Claims	1 - 3 =	- 0 -	X \$84.00	\$	
Multiple dependent claim(s) (if applicable)			+ \$280.00	\$	
TOTAL OF ABOVE CALCULATIONS =				\$ 890.00	
Reduction by 1/2 for Small Entity status, if applicable.				\$	
SUBTOTAL =				\$ 890.00	
Processing fee of \$130.00 for furnishing the English translation later than ___ 20 ___ 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	
TOTAL NATIONAL FEE =				\$ 890.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +				\$ 40.00	
TOTAL FEES ENCLOSED =				\$ 930.00	
				Amount to be: refunded	\$
				charged	\$

Applicant claims Small Entity status.

- a. ☒ A check in the amount of \$ 930.00 to cover the above fees is enclosed.
- b. ☐ Please charge my Deposit Account No. 03-2468 in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment, to Deposit Account No. 03-2468. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

COLLARD & ROE, P.C.
1077 Northern Boulevard
Roslyn, New York 11576-1696
(516) 365-9802

Express Mail No. EL 871 452 270 US

Date of Deposit March 13, 2002

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10, on the date indicated above, and is addressed to the Ass't. Commissioner for Patents, U.S. PTO, BOX PCT APPLICATION, Washington, D.C. 20231

Lisa L. Vulpis
Lisa L. Vulpis

Edward R. Freedman
Signature

Edward R. Freedman, Reg. No. 26.048

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Franz BLAIMSCHEIN

PCT NO.: PCT/AT 00/00225 PCT FILED: 23 August 2000

PRIORITY: GM 635/99 PRIORITY FILED: 16 September 1999

TITLE: TOOTHED-BELT OR CHAIN WHEEL

PRELIMINARY AMENDMENT

ATTN.: BOX PCT APPLICATION

Ass't. Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Preliminary to the initial Office Action, please amend the
above-identified application as follows:

IN THE SPECIFICATION:

On Page 1, line 1, please insert the following paragraphs:

--CROSS REFERENCE TO RELATED APPLICATIONS

Applicant claims priority under 35 U.S.C. §119 of Austrian
Application No. GM 635/99, filed on September 16, 1999. Applicant
also claims priority under 35 U.S.C. §120 of PCT/AT00/00225, filed
on August 23, 2000. The international application under PCT article
21(2) was not published in English.--

10070965-0343
20070965-0343

IN THE CLAIMS:

Please cancel claims 1-3 and replace with new claims 4-6 as attached hereto.

REMARKS

By this Preliminary Amendment, the application has been amended to conform with U.S. practice, the cross-reference to the related application has been inserted on page 1. Also, claims 1-3 have been replaced by new claims 4-6. No new matter has been introduced.

Entry of this amendment is respectfully requested.

Respectfully submitted,

Franz BLAIMSCHEIN


Allison C. Collard, Reg. No. 22,532
Edward R. Freedman, Reg. No. 26,048
Attorneys for Applicants

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Express Mail No. EL 871 452 270 US
Date of Deposit March 13, 2002

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. § 1.10, on the date indicated above, and is addressed to the Ass't. Commissioner for Patents, U.S. PTO, BOX PCT, Washington, D.C. 20231


Lisa L. Vulpis

CLAIMS:

4. A toothed-belt or chain wheel with a wheel body (1) consisting of a wheel rim (3) and a wheel hub (2), which wheel body carries a transmitter ring (5) with radially projecting shoulders (6) for detecting various angles of rotation or ranges of angles of rotation, characterized in that the transmitter ring (5) provided with inwardly projecting shoulders (6) can be inserted into the wheel rim (3) and can be attached to supports (7) which are distributed over the inner circumference of the wheel rim (3) and form an axial support for the transmitter ring (5.)
5. A toothed-belt or chain wheel as claimed in claim 4, characterized in that the supports (7) are provided in the neck zone of spokes (4) on the wheel rim (3).
6. A toothed-belt or chain wheel as claimed in claim 4, characterized in that the transmitter ring (5) can be attached to the supports (7) by spot welding.

10070965-001

(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES
PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
Internationales Büro



(43) Internationales Veröffentlichungsdatum
22. März 2001 (22.03.2001)

PCT

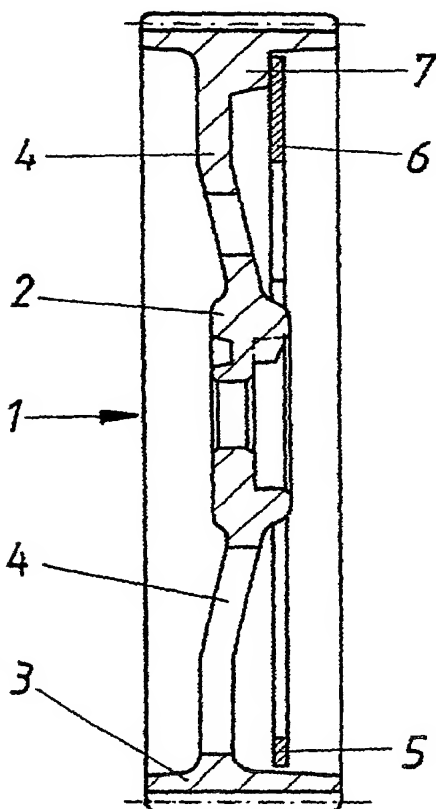
(10) Internationale Veröffentlichungsnummer
WO 01/20194 A1

- (51) Internationale Patentklassifikation⁷: **F16H 55/17** (71) Anmelder (für alle Bestimmungsstaaten mit Ausnahme von US): MIBA SINTERMETALL AKTIENGESELLSCHAFT [AT/AT]; Dr.-Mitterbauer-Strasse 3, A-4663 Laakirchen (AT).
- (21) Internationales Aktenzeichen: PCT/AT00/00225
- (22) Internationales Anmeldedatum: 23. August 2000 (23.08.2000) (72) Erfinder; und (75) Erfinder/Anmelder (nur für US): BLAIMSCHEIN, Franz [AT/AT]; A-4642 Sattledt 186 (AT).
- (25) Einreichungssprache: Deutsch (74) Anwälte: HÜBSCHER, Gerhard usw.; Spittelwiese 7, A-4020 Linz (AT).
- (26) Veröffentlichungssprache: Deutsch
- (30) Angaben zur Priorität: GM 635/99 16. September 1999 (16.09.1999) AT (81) Bestimmungsstaaten (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM,

[Fortsetzung auf der nächsten Seite]

(54) Title: TOOTHED-BELT WHEEL OR SPROCKET WHEEL

(54) Bezeichnung: ZAHNRIEMEN- ODER KETTENRAD



(57) Abstract: The invention relates to a toothed-belt wheel or sprocket wheel, comprising a wheel body (1) which consists of a wheel crown (3) and a hub (2). Said wheel body bears a transmission ring (5) with radial projections (6) for registering various angles of rotation or rotation angular domains. In order to obtain advantageous conditions for construction, the invention is characterised in that the transmission ring (5) which is provided with inward-facing projections (6) can be inserted into the wheel crown and can be fixed to supports (7) which are distributed around the inner periphery of the wheel crown (3), forming an axial support for said transmission ring (5).

(57) Zusammenfassung: Es wird ein Zahnriemen- oder Kettenrad mit einem aus einem Radkranz (3) und einer Nabe (2) bestehenden Radkörper (1) beschrieben, der einen Geberring (5) mit radial vorstehenden Ansätzen (6) zur Erfassung verschiedener Drehwinkel bzw. Drehwinkelbereiche trägt. Um vorteilhafte Konstruktionsverhältnisse zu schaffen, wird vorgeschlagen, dass der mit einwärts vorstehenden Ansätzen (6) versehene Geberring (5) in den Radkranz (3) einsetzbar und an über den Innenumfang des Radkranzes (3) verteilten, eine axiale Abstützung für den Geberring (5) bildenden Auflagen (7) befestigbar ist.

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i/p rtd -1-

Toothed-belt or chain wheel

Background of the invention

[0001] The invention relates to a toothed-belt or chain wheel with a wheel body consisting of a wheel rim and a wheel hub, which wheel body carries a transmitter ring with radially projecting shoulders for detecting various angles of rotation or ranges of angles of rotation.

Description of the prior art

[0002] In order to enable performing controls which depend on the angle of rotation or range of angle of rotation of a toothed-belt or chain wheel, the wheel body of the toothed-belt or chain wheel is connected with a transmitter ring which is provided with radially projecting shoulders for the contactless (e.g. electromagnetic) detection of the angle or rotation or ranges of angles of rotation as determined by said shoulders. The transmitter ring is placed on the wheel hub of the toothed-belt or chain wheel and is caulked with the hub, so that the shoulders project in a radially outwardly fashion into the scanning range of a respective sensor. Since the measurement precision of angle-of-rotation transducers with such transmitter rings which are arranged as stamped parts depends, among other things, on the surface evenness of the transmitter ring, a sufficient stiffness and thus a respective thickness of the transmitter ring is required in order to avoid having to cope with any distortions and thus measurement errors due to axial run-out, which shoulders should have a respective distance from the rotational shaft of the wheel body for reasons of the measurement precision. Notice must further be taken in this connection that due to the demand for the lowest possible weight, the shoulders which extend over a larger angle at circumference are supported by radial arms of the transmitter ring which contributes to the tendency towards distortions in the zone of the shoulders.

10070965-0001

Summary of the invention

[0003] The invention is thus based on the object of providing a toothed-belt or chain wheel of the kind mentioned above in such a way that, on the one hand, narrow run-out tolerances can be ensured and, on the other hand, savings in weight are enabled.

[0004] This object is achieved by the invention in such a way that the transmitter ring provided with inwardly projecting shoulders can be inserted into the wheel rim and can be attached to supports which are distributed over the inner circumference of the wheel ring and form an axial support for the transmitter ring.

[0005] Since the shoulders of the transmitter ring which cooperate with the sensor should be provided with a respective radial distance from the rotational shaft of the wheel body due to the desired measurement precision, the supports which project inwardly in this case can be disposed with a comparably low radial projecting length in the case of a transmitter ring which is not associated with the hub but with the wheel rim, which in connection with a ring attachment not over the circumference but over the face side of the transmitter ring reduces the requirements placed on the torsional stiffness which is necessary for the run-out tolerance, so that the thickness of the transmitter ring can be reduced accordingly, e.g. it can be halved. In this way it is not only possible to ensure the desired reduction in weight, but it is also possible to ensure the reduction of the balance error caused by the transmitter ring. The face-sided axial support of the transmitter ring is provided in a simple manner on respective supports of the wheel body, so that the transmitter ring merely needs to be axially inserted into the wheel rim until it rests on the supports and then needs to be connected with the supports.

[0006] Since the usual toothed-belt and chain wheels are provided with wheel spokes between the hub and the wheel rim, particularly simple constructional conditions are obtained for such toothed-belt and chain wheels when the supports are provided in the neck zone of the spokes on the wheel rim. In this case the

supports can be formed by a machining neck on the wheel spokes which hardly increases the weight of the wheel body. The supporting forces are absorbed in any case by the wheel spokes.

[0007] The transmitter ring can be glued tightly to the supports. Particularly favorable fastening conditions are obtained, however, when the transmitter ring can be attached to the supports by spot welding. In this case the supports form respective welding projections.

Brief description of the drawings

[0008] The subject matter is shown by way of example in the drawings, wherein:

Fig. 1 shows a toothed-belt wheel in a face view, and

Fig. 2 shows said toothed-belt wheel in a sectional view along line II-II of fig. 1

Detailed description of the preferred embodiments

[0009] As is shown by the embodiment according to figs. 1 and 2, the wheel body 1 consists of a hub 2 and a wheel rim 3 which is connected with the hub 2 via spokes 4.

[0010] In order to enable the contactless detection of various angles of rotation or ranges of angles of rotation of the wheel body 1 with the help of a sensor, a transmitter ring 5 with radially inwardly projecting shoulders 6 is inserted into the wheel rim 3, which shoulders determine certain angles of rotation with their radial delimitations and certain ranges of angles of rotation with the help of their circumferential extensions which can be detected by an associated sensor which is stationary with respect to the rotating wheel body 1. The transmitter ring 5 rests axially with its one face side on supports 7, e.g. welding projections, to which the transmitter ring 5 can be welded by spot welding. It is also possible to provide any other suitable fastening method to connect the transmitter ring 5 with the supports

7. The supports 7 are disposed in the neck range of the spokes 4 on the wheel rim 3 and form with their machining neck an axially normal bearing surface for the transmitter ring 5. Since, as a result of the support of transmitter ring 5 on the supports 7, it is possible to substantially prevent any distortion of the transmitter ring 5 because the necks 6 project radially only to a comparably small amount over the actual ring body and expand in sectors against said ring body. This means that the transmitter ring 5, as compared to transmitter rings which are disposed on the hub 2, are provided with radially outwardly projecting necks and correspond in their position and arrangement to the necks 6 of a transmitter ring 5 in accordance with the invention, need to have a clearly reduced torsional stiffness for maintaining the required run-out tolerances, which has a direct effect on the thickness and concerning the ring weight. Moreover, the balance error which is caused by such transmitter rings is reduced in comparison with conventional transmitter rings. Since it is also possible to reduce the production efforts, particularly favorable constructional conditions are obtained without having to make any changes concerning the sensor.

1007055-03-100

CLAIMS:

1. A toothed-belt or chain wheel with a wheel body (1) consisting of a wheel rim (3) and a wheel hub (2), which wheel body carries a transmitter ring (5) with radially projecting shoulders (6) for detecting various angles of rotation or ranges of angles of rotation, characterized in that the transmitter ring (5) provided with inwardly projecting shoulders (6) can be inserted into the wheel rim (3) and can be attached to supports (7) which are distributed over the inner circumference of the wheel rim (3) and form an axial support for the transmitter ring (5.)
2. A toothed-belt or chain wheel as claimed in claim 1, characterized in that the supports (7) are provided in the neck-zone of spokes (4) on the wheel rim (3).
3. A toothed-belt or chain wheel as claimed in claim 1 or 2, characterized in that the transmitter ring (5) can be attached to the supports (7) by spot welding.

10070995-034309

Abstract:

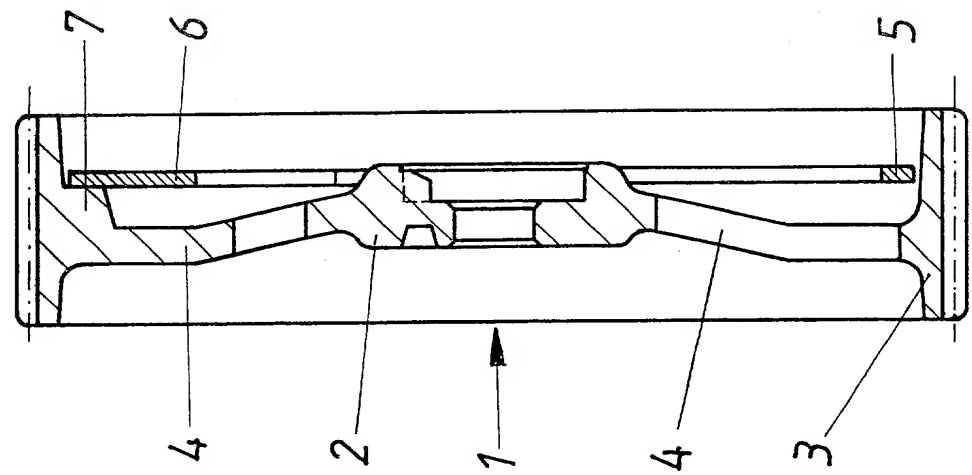
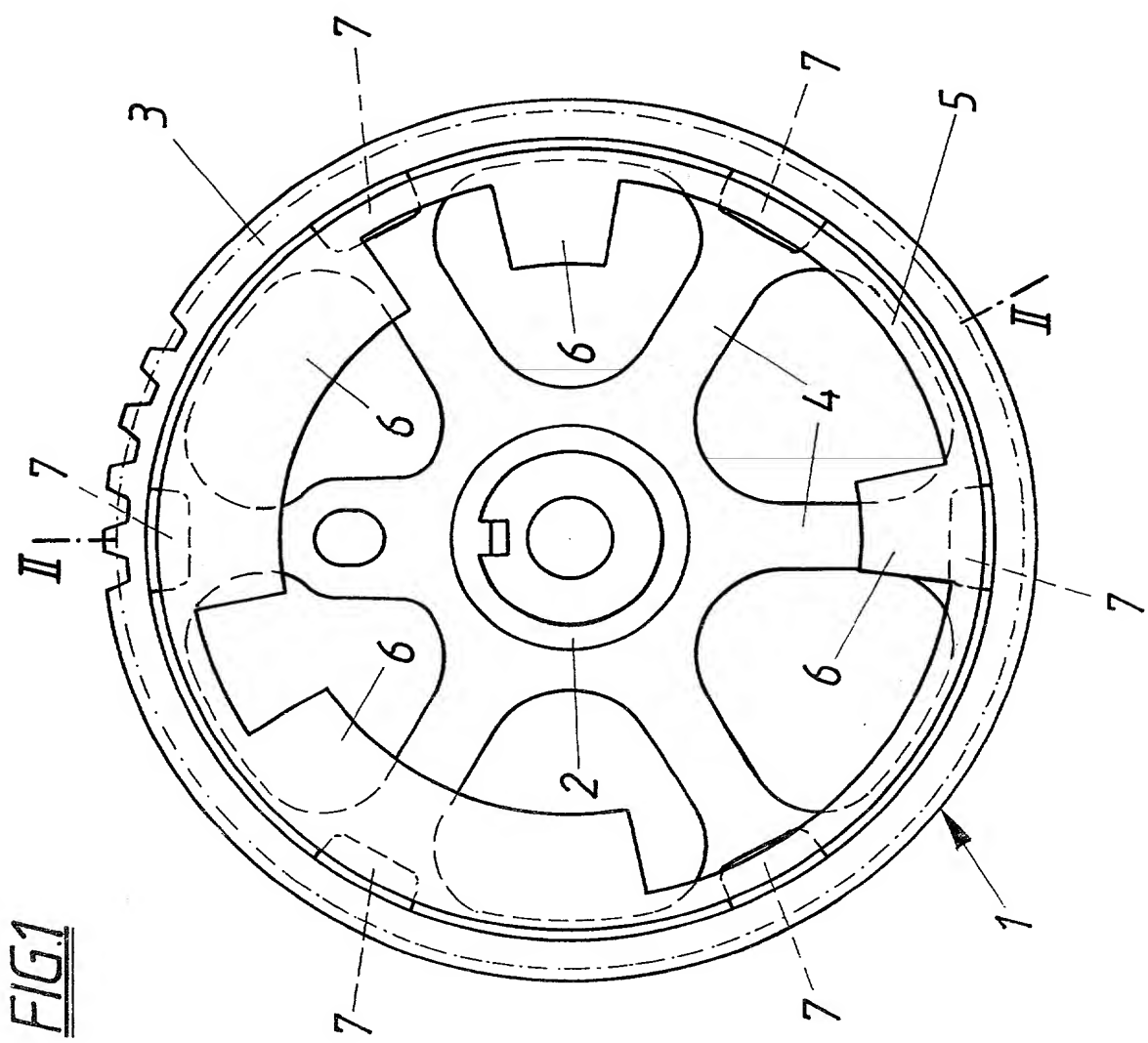
A toothed-belt or chain wheel

A toothed-belt or chain wheel is described with a wheel body (1) consisting of a wheel rim (3) and a wheel hub (2), which wheel body carries a transmitter ring (5) with radially projecting shoulders (6) for detecting various angles of rotation or ranges of angles of rotation. In order to provide advantageous constructional conditions it is proposed that the transmitter ring (5) provided with inwardly projecting shoulders (6) can be inserted into the wheel rim (3) and can be attached to supports (7) which are distributed over the inner circumference of the wheel rim (3) and form an axial support for the transmitter ring (5).

1007095-0400

FIG.1

FIG.2



10/070965

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Toothed-belt or chain wheel

the specification of which (check only one item below):

- ☐ is attached hereto.
- ☐ was filed as United States application
Serial No. _____
on _____,
and was amended
on _____ (if applicable).
- ☒ was filed as PCT international application
Number PCT/AT 00/00225
on 23 August 2000,
and was amended under PCT Article 19
on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:

COUNTRY (if PCT, indicate "PCT")	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 USC 119
Austria	GM 635/99	16 September 1999	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. 120:

U.S. APPLICATIONS			STATUS (Check One)		
U.S. APPLICATION NUMBER	U.S. FILING DATE		PATENTED	PENDING	ABANDONED
PCT APPLICATIONS DESIGNATING THE U.S.					
PCT APPLICATION NO.	PCT FILING DATE	U.S. SERIAL NUMBERS ASSIGNED (if any)			

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (List name and registration numbers):
ALLISON C. COLLARD, Registration No. 22,532; KURT KELMAN, Registration No. 18,628;
EDWARD R. FREEDMAN, Registration No. 26,048; JOHN G. TUTUNJIAN, Registration No. 39,405;
ELIZABETH COLLARD RICHTER, Registration No. 35,103;

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1077 Northern Boulevard
Roslyn, New York 11576

Direct Telephone Calls to:
(name and telephone number)
(516) 365-9802

2	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
		Blaimschein	Franz	
0	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
		Sattledt	Austria	Austria
1	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
		Sattledt 186	Sattledt	AT / A 4642
2	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
0	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
2	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
2	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
0	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
3	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 201

SIGNATURE OF INVENTOR 202

SIGNATURE OF INVENTOR 203

DATE

15.2.2002

DATE

DATE